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ABSTRACT

The purpose of this study was to investigate whether there are differences between males and females on locus of control, if experimental instructions differentially affect the performance of internals as opposed to externals, and if locus of control differentially influences performance on distinct types of aptitude tests. The Children's Nowicki-Strickland instrument was given to 144 children to determine their scores on locus of control. Following completion of the scale, subjects were divided into one of three performance feedback conditions: success, failure, and no feedback. Results indicated that internals scored significantly higher on verbal problem solving measures than did externals. There was a connection between locus of control and performance on a verbal inductive reasoning component of an aptitude test battery, but not on a spatial inductive reasoning test. No sex differences were reported, and feedback condition did not interact with locus of control.
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LOCUS OF CONTROL, AND EXPECTATIONAL SET,
ON TWO APTITUDE MEASURES

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Abstract

The purpose of this study was to investigate whether there are differences between males and females on locus of control, if experimental instructions differentially affect the performance of internals as opposed to externals, and if locus of control differentially influences performance on distinct types of aptitude tests. The Children's Nowicki-Strickland instrument was given to 144 children to determine their scores on locus of control. Following completion of the scale, subjects were divided into one of three performance feedback conditions: success, failure, and no feedback. Results indicated that internals scored significantly higher on verbal problem solving measures than did externals. No sex differences were reported, and feedback condition did not interact with locus of control.

Locus of Control, and Expectational Set
On Two Aptitude Measures

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Locus of control (Rotter, 1966) concerns the extent to which people think their behavior is controlled by outside forces or fate (external) as compared to self-control or free will (internal). Previous research has shown that individuals who perceive themselves as having self-control are less influenced by the expectational set of others than those who feel their destiny is controlled by outside forces. For example, internals are less handicapped by failure than externals (MacDonald and Hall, 1971). In addition, when instructions are given for tasks requiring skill, more questions are asked by internals than externals (Davis and Phares, 1967). This study concerns the extent to which the internal versus external locus of control variable interacts with experimentally induced expectational sets of others on two different aptitude tests.

Previous research (e.g., Nowicki and Strickland, 1973) has indicated that an internal locus of control is positively related to academic achievement. However, little research has supported a relationship between locus of control and tests of academic aptitude. The previous absence of support for a connection between locus of control and academic aptitude may derive from the heterogeneous set of tasks that determine aptitude. Quite possibly, locus of control differentially influences performance

on distinct types of aptitude tests, and the influence may be obscured when summed across these varied types of tests. The current study examined the influence of locus of control only in the context of inductive reasoning tasks that frequently comprise tests of academic intelligence. These tests require the examinee to initiate a discovery process that abstracts a general rule from the specific elements of a problem display. Such tasks should be quite sensitive to the influence of locus of control on aptitude test performance if such an influence exists.

Two sets of inductive reasoning tests were employed in this study, one composed of verbal elements and another composed of spatially manipulated geometric figures. Since locus of control has been found to be related to school achievement, which usually involves verbal skills, it was thought that locus of control might have a stronger connection with the verbal reasoning test than with the spatial reasoning test.

Finally, the study examined whether sex differences interact with locus of control and expectations of success in inductive reasoning tasks. Rotter (1966) asserted that males and females do not differ in their degree of internality-externality. However, Joe (1971) has claimed that sex influences beliefs about the sources of control over abilities and behaviors.

Method

Subjects

Subjects were 144 white, normal middle class, fifth grade students attending public schools in metropolitan Atlanta. Subjects were randomly selected from a pool of 248 subjects

returning parental consent forms with the constraint that equal numbers of males and females be selected.

Materials

Locus of control was determined by administering the Nowicki-Strickland Locus of Control Scale (CNS-IE). This instrument has 40 yes/no items and is scored in the external direction. Inductive reasoning was assessed with the verbal analogy subtest of the Cognitive Abilities Test (CAT) and with Raven's Standard Progressive Matrices.

Procedure

Subjects were first administered the CNS-IE. The subjects of each sex in the bottom third were designated Low Externals (i.e., internals); those in the middle third were identified as Medium Externals; and those in the top third, High Externals. Following completion of the CNS-IE all subjects took a sham test that consisted of a four question verbal component and a four question spatial relations component. The purpose of the sham test was to assign subjects to different feedback condition groups.

Equal numbers of subjects from each sex and locus of control group were randomly assigned to three performance feedback conditions: Success, Failure, and No Feedback. Subjects in the Success condition were told that they had done quite well on the sham test and would probably do so on upcoming tests that the experimenter would administer. Subjects in the Failure condition were told that they did not do well, but that there was a chance that they might improve on later tests.

Following administration of the sham test and the feedback given in the Success and Failure conditions, all subjects were administered the Raven Progressive Matrices and the CAT verbal analogies. A few days after completing the experiment, all subjects were debriefed.

Results

The locus of control screening identified three different locus of control groups. The mean, median, standard deviation and range were calculated by SPSS computer program. Findings were that mean scores were 8.86 for low externals, 13.57 for medium externals, and 19.11 for high externals.

The mean, median, standard deviation and range of the locus of control scores were obtained for the initial group of students and then separately for males and females to determine if these groups were, in fact, different by virtue of their locus of control scores. The findings indicated that the locus of control scores for males, females, and both groups combined had nearly equal means, medians, standard deviations and ranges.

A Pearson correlation for the Raven scores and the CAT scores was calculated by the SPSS Computer Program to determine if, in fact, these tests were dependent on one another. Results of the Pearson correlation showed that $r = .60$, and was significant at $p < .01$. This indicated the use of a multivariate analysis of variance (MANOVA) rather than two independent analyses of variance (ANOVA).

The MANOVA procedure was conceptualized by a $3 \times 3 \times 2$ factorial design (3 locus of control $\times$ 3 instructional

expectation x 2 sex). The two dependant variables were the scores on the Raven and the scores on the CAT. The results of the MANOVA indicated no three way interactions between locus of control, sex, and instructions.

Analysis of mixed variables effects on the test scores for locus of control and instructions showed no effects. The sex by locus of control comparison showed no effects. Analysis of the combined effect of sex and instructional expectation indicated a marginally significant interaction on the MANOVA; $p < .053$. The canonical correlation was .26 for both tests. However, the univariate F tests indicated that neither the verbal nor the non-verbal scores contributed significantly to the interaction effect. The standardized discriminant function co-efficients showed no difference in the relative contribution of either the verbal or non-verbal scores (-1.17, 1.12) suggesting that it was the combined test scores that yielded the significant finding for sex and instructions.

Analysis of the results of the single variable effects from the MANOVA indicated that locus of control significantly affected combined CAT and Raven test scores. In the single variable effects, locus of control yielded an overall canonical correlation of .36 which was significant at $p < .01$, meaning that Externals scored significantly lower on the combined problem solving tasks than internals. The univariate F tests revealed that the CAT was the significantly variable, $p < .01$, contributing to the canonical correlation. The standard discriminant function coefficient revealed that the CAT was the

significant variable, $p < .01$, contributing to the canonical correlation. The standard discriminant function coefficient revealed that the Raven scores contributed $-.24$ (n.s.) and the CAT scores 1.125 (significant at $p < .001$) meaning that the CAT's relative contribution to the canonical correlation was nearly five times greater than the Raven. Consequently, externals perform particularly poorly on verbal measures as compared to internals while non verbal measures are not significant.

Futher analysis of single variable effects indicated that sex differences do not affect verbal or non-verbal tests in children.

Conclusion

The current study indicated that there is a connection between locus of control and performance in a verbal inductive reasoning component of aptitude test battery. However, the influence of locus of control in academic aptitude test performance did not extend to a spatial inductive reasoning test. This confirms our contention that locus of control is related to aptitude, but specifically aptitude for dealing with verbal content. The results also substantiated Rotter's contention that there are no sex differences in locus of control. However, sex differences on verbal versus non-verbal tasks do not usually emerge before adolescence.

Differences in processing verbal material may account for the reason why internals are better school achievers but not more intelligent than externals. Socialization practices may be a critical factor in determining how individuals process information. The demand characteristics of the experiment were such that the experimenter instructions did not influence the performance of externals as opposed to internals.

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